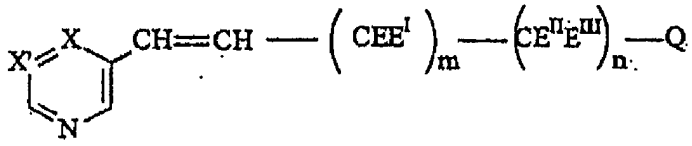
In re application of: **DULL ET AL.**
Serial No: **09/845,526** Examiner: **V. Balasubramanian**
Filed: **April 30, 2001** Group Art Unit: **1624**
For: **PHARMACEUTICAL COMPOSITIONS AND METHODS FOR USE**

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

1. (Currently Amended) A compound of the formula:



where X ~~and X' are individually~~ is carbon bonded to a substituent species selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, heterocyclyl, substituted heterocyclyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl; arylalkyl, substituted arylalkyl, halo, -OR', -NR'R", $-CF_3$, -CN, $-NO_2$, $-C_2R'$, -SR', $-N_3$, C(=O)NR'R", -NR'C(=O)R", -C(=O)R', -C(=O)OR', -OC(=O)R', $-O(CR'R")_rC(=O)R'$, $-O(CR'R")_rNR'R"$ $-O(CR'R")_rNR"C(=O)R'$, $-O(CR'R")_rNR"SO_2R'$, -OC(=O)NR'R", -NR'C(=O)O R", $-SO_2R'$, $-SO_2NR'R"$, and $-NR'SO_2R"$, where R' and R" are individually hydrogen, lower alkyl, cycloalkyl, heterocyclyl, or an aromatic group-containing species selected from the group consisting of phenyl, benzyl, pyridinyl, pyrimidinyl, pyrazinyl, pyridazinyl, indolyl and quinolinyl, and r is an integer from 1 to 6, or R' and R" can together form a cycloalkyl group;

X' is COR' where R' is selected from the group consisting of aryl, substituted aryl, heteroaryl, substituted heteroaryl, non-aromatic heterocyclyl, substituted non-aromatic heterocyclyl, non-aromatic heterocyclylalkyl and substituted non-aromatic heterocyclylalkyl;

m is an integer and n is an integer such that the sum of m plus n is 0, 1, 2 or 3;

E, E^I, E^{II} and E^{III} individually represent hydrogen or a suitable non-hydrogen substituent selected from the group consisting of alkyl, substituted alkyl, halo-substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl; and Q is selected from:

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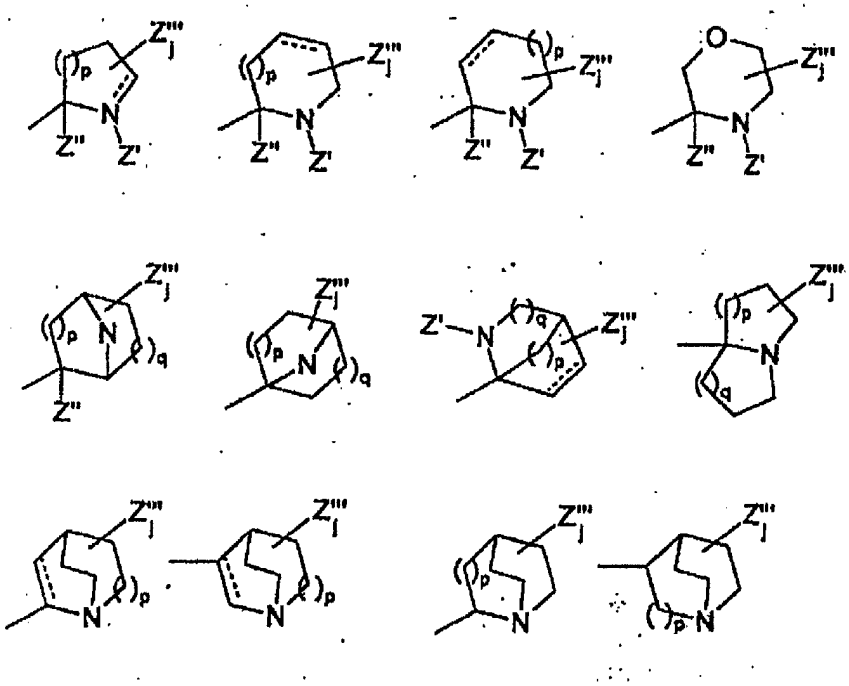

where Z' represents hydrogen or lower alkyl, acyl, alkoxycarbonyl, or aryloxycarbonyl; Z" is hydrogen or lower alkyl; and Z"' is a non-hydrogen substituent selected from the group consisting of alkyl, substituted alkyl, halo-substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl; the dotted line indicates a carbon-carbon single bond or a carbon-carbon double bond, p is 0, 1 or 2; q is 0, 1, 2 or 3; and j is an integer from 0 to 3,

wherein Z'"j refers to j number of Z'" substituents.

Claim 2. (Cancelled)

3. (Currently Amended) The compound of Claim ~~2~~ 1 wherein R' is phenyl or substituted phenyl.

4. (Original) The compound of Claim 1 wherein j is 0.

5. (Original) The compound of Claim 1 wherein q is 0 or 1.

6. (Original) The compound of Claim 1 wherein Z' is hydrogen or methyl and Z" is hydrogen.

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7. (Currently Amended) The compound of Claim 1, wherein the compound has an (E) geometry.

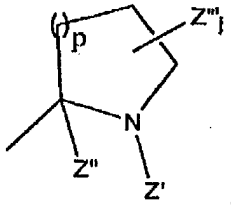
8. (Original) The compound of Claim 1 wherein m and n are 0.

9. (Original) The compound of Claim 1 wherein m is 1 and n is 0, and E is hydrogen and E^I is methyl.

10. (Original) The compound of Claim 1 wherein m is 1 and n is 1, and E, E^I and E^{II} each are hydrogen and E^{III} is methyl.

11. (Original) The compound of Claim 1 wherein the sum of m plus n is 1 or 2.

12. (Original) The compound of Claim 1 wherein Q is

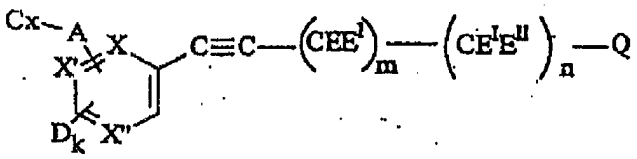


13. (Currently Amended) The compound of Claim 1, wherein the compound is (S)-(E)-3(2-pyrrolidin-2-ylvinyl)pyridine.

14. (Currently Amended) The compound of Claim 1, wherein the compound is (E)-(S)-3(4-hydroxyphenoxy)-5-(pyrrolidin-2-ylvinyl)pyridine.

15. (Currently Amended) The compound of Claim 1, wherein the compound is (E,S)-3-cyclopentyloxy-5-(pyrrolidin-2-ylvinyl)pyridine.

16. (Currently Amended) A compound of the formula:



where X'' is nitrogen ~~and X, X' are individually~~ is carbon bonded to a substituent species selected from the group consisting of hydrogen alkyl, substituted alkyl, alkenyl, substituted alkenyl, heterocyclyl, substituted heterocyclyl, cycloalkyl, substituted cycloalkyl, aryl, substituted

aryl, alkylaryl, substituted alkylaryl; arylalkyl, substituted arylalkyl, halo, -OR', -NR'R", -CF_3, -CN, -NO_2, -C_2R', -SR', -N_3, C(=O)NR'R", -NR'C(=O)R", -C(=O)R', -C(=O)OR', -OC(=O)R', -$O(CR'R")_rC(=O)R'$, -$O(CR'R")_rNR'R"$ -$O(CR'R")_rNR"C(=O)R'$, -$O(CR'R")_rNR"SO_2R'$, -OC(=O)NR'R", -NR'C(=O)O R", -SO_2R', -$SO_2NR'R"$, and -$NR'SO_2R"$, where R' and R" are individually hydrogen, lower alkyl, cycloalkyl, heterocyclyl, or an aromatic group-containing species selected from the group consisting of phenyl, benzyl, pyridinyl, pyrimidinyl, pyrazinyl, pyridazinyl, indolyl and quinolinyl, and r is an integer from 1 to 6, or R' and R" can together form a cycloalkyl group;

X' is COR' where R' is selected from the group consisting of aryl, substituted aryl, heteroaryl, substituted heteroaryl, non-aromatic heterocyclyl, substituted non-aromatic heterocyclyl, non-aromatic heterocyclylalkyl and substituted non-aromatic heterocyclylalkyl;

A is O, C=O or a covalent bond; D is a suitable non-hydrogen substituent species selected from the group of substituent species for X, ~~X' and X"~~; k is 0, 1 or 2; Cx is selected from a group consisting of aryl, substituted aryl, heteroaryl, substituted heteroaryl, non-aromatic heterocyclyl, substituted non-aromatic heterocyclyl, non-aromatic heterocyclylalkyl and substituted non-aromatic heterocyclylalkyl; m is an integer and n is an integer such that the sum of m plus n is 0, 1, 2 or 3; E, E^I, E^{II} and E^{III} individually represent hydrogen or a suitable non-hydrogen substituent selected from the group consisting of alkyl, substituted alkyl, halo-substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl; and Q is selected from:

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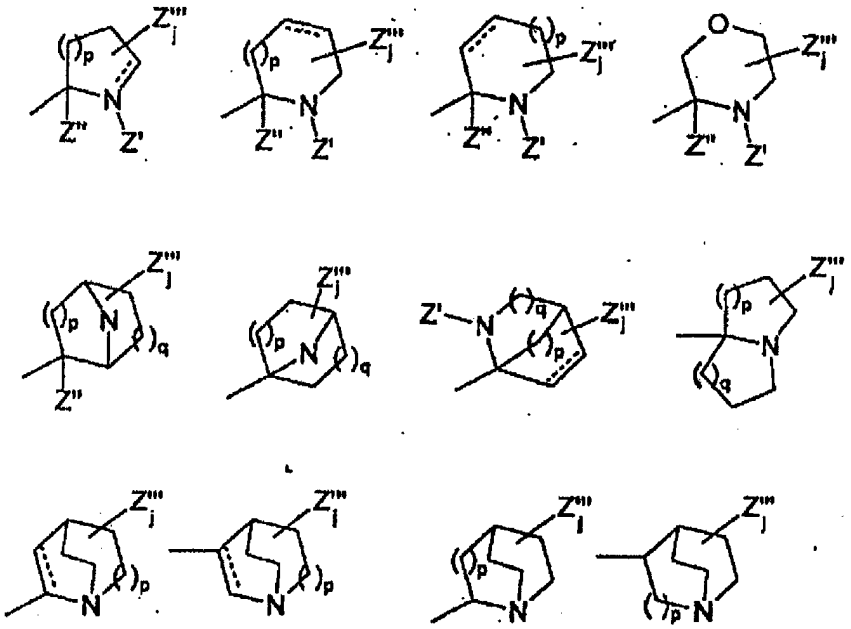
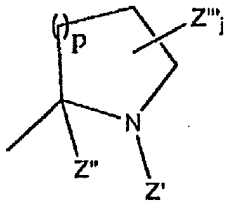


where Z' represents hydrogen or lower alkyl, acyl, alkoxycarbonyl, or aryloxycarbonyl; Z" is hydrogen or lower alkyl; and Z"' is a non-hydrogen substituent selected from the group consisting of alkyl, substituted alkyl, halo-substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl; the dotted line indicates a carbon-carbon single bond or a carbon-carbon double bond; p is 0, 1 or 2; q is 0, 1, 2 or 3; and j is an integer from 0 to 3,

wherein Z'"j refers to j number of Z'" substituents.

Claims 17-22 (Cancelled)

23. (Original) The compound of Claim 16, wherein Q is



24. (Currently Amended) ~~The~~ A compound ~~of Claim 16,~~ selected from the group consisting of (S)-5-(2-pyrrolidin-2-ylethynyl)pyrimidine, (R)-5-(2-pyrrolidin-2-ylethynyl)pyrimidine, (S)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (R)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-isopropoxy-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-phenyl-5-

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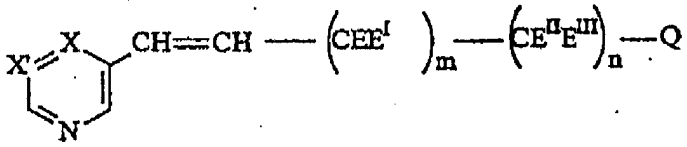
(pyrrolidin-2-ylethynyl)pyridine, (S)-3-(phenoxyphenyl)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(4-methoxyphenoxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(4-hydroxyphenoxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-cyclopentyloxy-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-cyclohexyloxy-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(4-pyrrolidine-1-sulfonyl)phenoxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(3-pyridyloxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(pyrrolidin-2-ylethynyl)-5-(tetrahydropyran-4-yloxy)pyridine, and (S)-3-(3,5-dihydroxy)phenoxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine.

25. (Currently amended) A pharmaceutical composition incorporating a compound of



where X ~~and X' are individually is~~ carbon bonded to a substituent species selected from the group consisting of hydrogen alkyl, substituted alkyl, alkenyl, substituted alkenyl, heterocyclyl, substituted heterocyclyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl; arylalkyl, substituted arylalkyl, halo, -OR', -NR'R", $-CF_3$, -CN, $-NO_2$, $-C_2R'$, -SR', $-N_3$, C(=O)NR'R", -NR'C(=O)R", -C(=O)R', -C(=O)OR', -OC(=O)R', $-O(CR'R")_rC(=O)R'$, $-O(CR'R")_rNR'R"$ $-O(CR'R")_rNR"C(=O)R'$, $-O(CR'R")_rNR"SO_2R'$, -OC(=O)NR'R", -NR'C(=O)O R", $-SO_2R'$, $-SO_2NR'R"$, and $-NR'SO_2R"$, where R' and R" are individually hydrogen, lower alkyl, cycloalkyl, heterocyclyl, or an aromatic group-containing species selected from the group consisting of phenyl, benzyl, pyridinyl, pyrimidinyl, pyrazinyl, pyridazinyl, indolyl and quinolinyl, and r is an integer from 1 to 6, or R' and R" can together form a cycloalkyl group;

X' is COR' where R' is selected from the group consisting of aryl, substituted aryl, heteroaryl, substituted heteroaryl, non-aromatic heterocyclyl, substituted non-aromatic heterocyclyl, non-aromatic heterocyclylalkyl and substituted non-aromatic heterocyclylalkyl;

m is an integer and n is an integer such that the sum of m plus n is 0, 1, 2 or 3; E, E^I, E^{II} and E^{III} individually represent hydrogen or a suitable non-hydrogen substituent selected from the group consisting of alkyl, substituted alkyl, halo-substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl; and Q is selected from:

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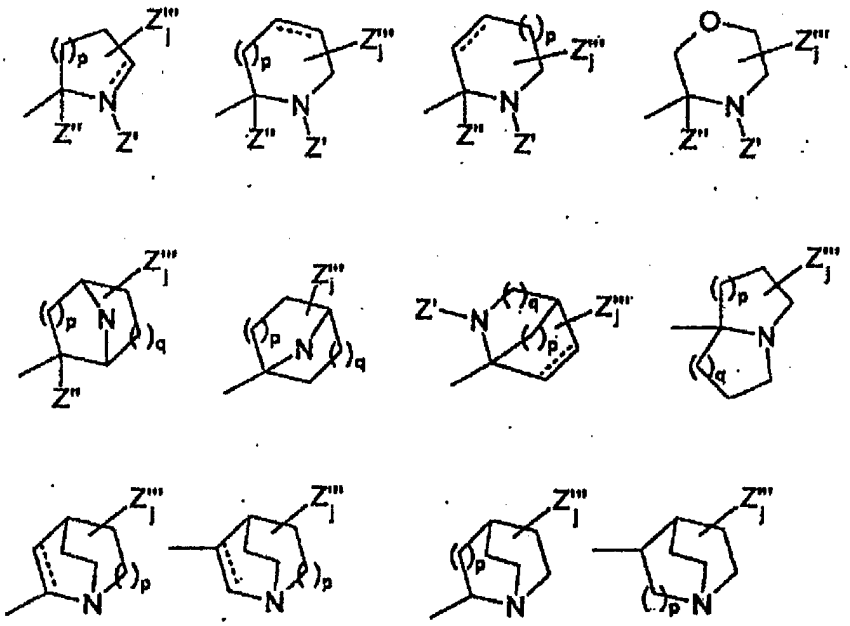

where Z' represents hydrogen or lower alkyl, acyl, alkoxycarbonyl, or aryloxycarbonyl; Z" is hydrogen or lower alkyl; and Z''' is a non-hydrogen substituent selected from the group consisting of alkyl, substituted alkyl, halo-substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl; the dotted line indicates a carbon-carbon single bond or a carbon-carbon double bond; p is 0, 1 or 2; q is 0, 1, 2 or 3; and j is an integer from 0 to 3, along with a pharmaceutically acceptable carrier,

wherein Z'''j refers to j number of Z''' substituents.

Claim 26. (Cancelled)

27. (Previously Presented) The pharmaceutical composition of Claim 25 wherein R' is phenyl or substituted phenyl.

28. (Original) The pharmaceutical composition of Claim 25 wherein j is 0.

29. (Original) The pharmaceutical composition of Claim 25 wherein q is 0 or 1.

30. (Original) The pharmaceutical composition of Claim 25 wherein Z' is hydrogen or methyl and Z" is hydrogen.

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31. (Currently Amended) The pharmaceutical composition of Claim 25, wherein the compound has an (E) geometry.

32. (Original) The pharmaceutical composition of Claim 25 wherein all of E, E^{I}, E^{II} and E^{III} individually are hydrogen.

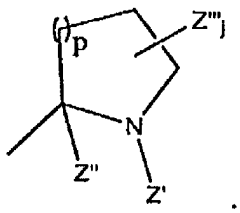
33. (Original) The pharmaceutical composition of Claim 25 wherein m and/or n are 0.

34. (Original) The pharmaceutical composition of Claim 25 wherein m is 1 and n is 0, and E is hydrogen and E^{I} is methyl.

35. (Original) The pharmaceutical composition of Claim 25 wherein m is 1 and n is 1, and E, E^{I} and E^{II} each are hydrogen and E^{III} is methyl.

36. (Original) The pharmaceutical composition of Claim 25 wherein the sum of m plus n is 1 or 2.

37. (Original) The pharmaceutical composition of Claim 25 wherein Q is



38. (Currently Amended) pharmaceutical composition of Claim 25, wherein the compound is (S)-(E)-3(2-pyrrolidin-2-ylvinyl)pyridine.

39. (Currently Amended) pharmaceutical composition of Claim 25, wherein the compound is (E)-(S)-3(4-hydroxyphenoxy)-5-(pyrrolidin-2-ylvinyl)pyridine.

40. (Currently Amended) The pharmaceutical composition of Claim 25, wherein the compound is (E,S)-3-cyclopentyloxy-5-(pyrrolidin-2-ylvinyl)pyridine.

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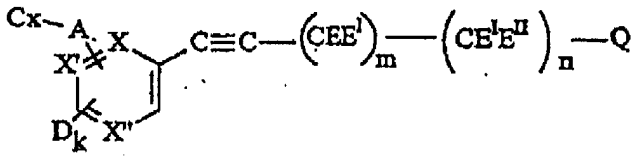
41. (Currently Amended) A pharmaceutical composition incorporating a compound of the formula:



where X" is nitrogen and X ~~and X' are individually~~ is carbon bonded to a substituent species selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, heterocyclyl, substituted heterocyclyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl; arylalkyl, substituted arylalkyl, halo, -OR', -NR'R", $-CF_3$, -CN, $-NO_2$, $-C_2R'$, -SR', $-N_3$, C(=O)NR'R", -NR'C(=O)R", -C(=O)R', -C(=O)OR', -OC(=O)R', -O(CR'R")$_r$C(=O)R', -O(CR'R")$_r$NR'R" -O(CR'R")$_r$NR"C(=O)R', -O(CR'R")$_r$NR"SO_2R', -OC(=O)NR'R", -NR'C(=O)O R", $-SO_2$R', $-SO_2$NR'R", and -NR'SO_2R", where R' and R" are individually hydrogen, lower alkyl, cycloalkyl, heterocyclyl, or an aromatic group-containing species selected from the group consisting of phenyl, benzyl, pyridinyl, pyrimidinyl, pyrazinyl, pyridazinyl, indolyl and quinolinyl, and r is an integer from 1 to 6, or R' and R" can together form a cycloalkyl group;

X' is COR' where R' is selected from the group consisting of aryl, substituted aryl, heteroaryl, substituted heteroaryl, non-aromatic heterocyclyl, substituted non-aromatic heterocyclyl, non-aromatic heterocyclylalkyl and substituted non-aromatic heterocyclylalkyl;

A is O, C=O or a covalent bond; D is a suitable non-hydrogen substituent species selected from the group of substituent species for X~~, X' and X"~~; k is 0, 1 or 2; Cx is selected from a group consisting of aryl, substituted aryl, heteroaryl, substituted heteroaryl, non-aromatic heterocyclyl, substituted non-aromatic heterocyclyl, non-aromatic heterocyclylalkyl and substituted non-aromatic hetero-cyclylalkyl; m is an integer and n is an integer such that the sum of m plus n is 0, 1, 2 or 3; E, E^I, E^{II} and E^{III} individually represent hydrogen or a suitable non-hydrogen substituent selected from the group consisting of alkyl, substituted alkyl, halo-substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl; and Q is selected from:

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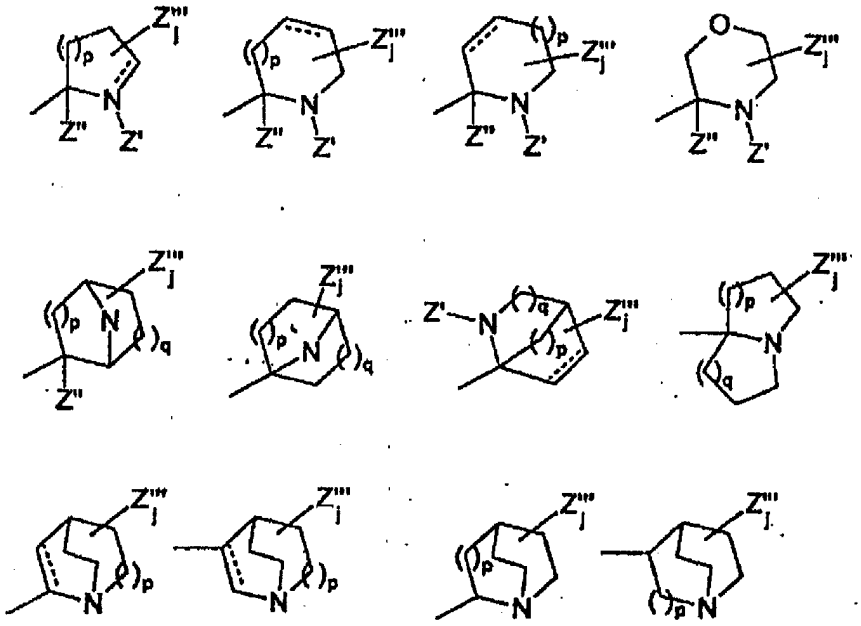
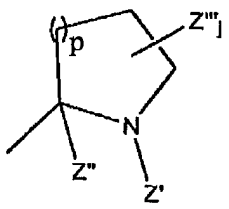


where Z' represents hydrogen or lower alkyl, acyl, alkoxycarbonyl, or aryloxycarbonyl; Z" is hydrogen or lower alkyl; arid Z''' is a non-hydrogen substituent selected from the group consisting of alkyl, substituted alkyl, halo-substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl; the dotted line indicates a carbon-carbon single bond or a carbon-carbon double bond; p is 0, 1 or 2; q is 0, 1, 2 or 3; and j is an integer from 0 to 3, and a pharmaceutically acceptable carrier,

wherein Z'''j refers to j number of Z''' substituents.

Claims 42-48. (Cancelled)

49. (Original) The pharmaceutical composition of Claim 41 wherein Q is



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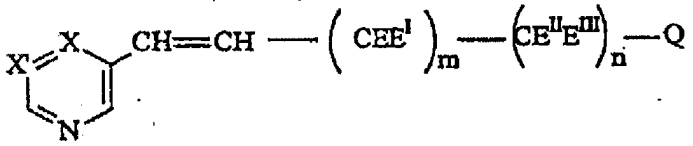
50. (Currently Amended) ~~The~~ A pharmaceutical composition ~~of Claim 41 wherein the~~ comprising a compound ~~is~~ selected from the group consisting of selected from the group consisting of (S)-5-(2-pyrrolidin-2-ylethynyl)pyrimidine, (R)-5-(2-pyrrolidin-2-ylethynyl)pyrimidine, (S)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (R)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-isopropoxy-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-phenyl-5-(pyrrolidin-2-ylethynyl)pyridine, (S)-3-(phenoxyphenyl)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(4-methoxyphenoxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(4-hydroxyphenoxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-cyclopentyloxy-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-cyclohexyloxy-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(4-pyrrolidine-1-sulfonyl)phenoxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(3-pyridyloxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(pyrrolidin-2-ylethynyl)-5-(tetrahydropyran-4-yloxy)pyridine, and (S)-3-(3,5-dihydroxy)phenoxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, and a pharmaceutically acceptable carrier.

51. (Previously Presented) A method for treating a central nervous system disorder associated with dysfunction of nicotinic receptors, said method comprising administering an effective amount of a compound having the formula:



where X and X' are individually carbon bonded to a substituent species selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, heterocyclyl, substituted heterocyclyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl; arylalkyl, substituted arylalkyl, halo, -OR', -NR'R", -CF_3, -CN, -NO_2, -C_2R', -SR', -N_3, C(=O)NR'R", -NR'C(=O)R", -C(=O)R', -C(=O)OR', -OC(=O)R', -O(CR'R")$_r$C(=O)R', -O(CR'R")$_r$NR'R" -O(CR'R")$_r$NR"C(=O)R', -O(CR'R")$_r$NR"SO_2R', -OC(=O)NR'R", -NR'C(=O)OR", -SO_2R', -SO_2NR'R", and -NR'SO_2R", where R' and R" are individually hydrogen, lower alkyl, cycloalkyl, heterocyclyl, or an aromatic group-containing species selected from the group consisting of phenyl, benzyl, pyridinyl, pyrimidinyl, pyrazinyl, pyridazinyl, indolyl and quinolinyl, and r is an integer from 1 to 6, or R' and R" can together form a cycloalkyl group;

m is an integer and n is an integer such that the sum of m plus n is 0, 1, 2 or 3; E, E^I, E^{II} and E^{III} individually represent hydrogen or a suitable non-hydrogen substituent selected from the group consisting of alkyl, substituted alkyl, halo-substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl; and Q is selected from:

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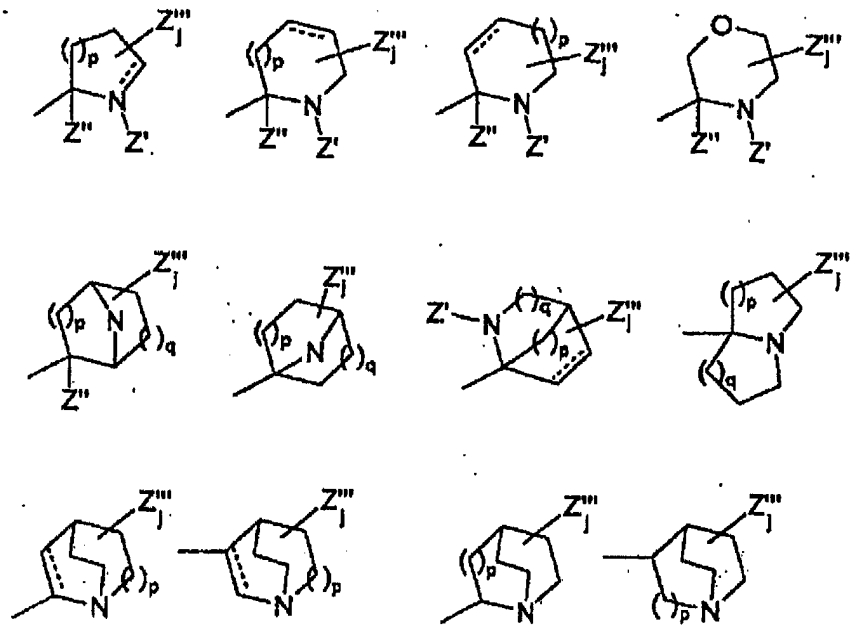


where Z' is hydrogen, lower alkyl, acyl, alkoxycarbonyl, or aryloxycarbonyl; Z" is hydrogen or lower alkyl; and Z"' is a non-hydrogen substituent selected from the group consisting of alkyl, substituted alkyl, halo-substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl; the dotted line indicates a carbon-carbon single bond or a carbon-carbon double bond; p is 0, 1 or 2; q is 0, 1, 2 or 3; and j is an integer from 0 to 3,

wherein Z'"j refers to j number of Z'" substituents, and

wherein the central nervous system disorder is selected from the group consisting of pre-senile dementia, senile dementia, HIV-dementia, multiple cerebral infarcts, Parkinsonism, Pick's disease, Huntington's chorea, tardive dyskindesia, hyperkinesias, mania, attention deficit disorder, anxiety, depression, mild cognitive impairment, dyslexia, schizophrenia and Tourette's syndrome.

52. (Previously Presented) The method of Claim 51 wherein X' is COR' where R' is selected from the group consisting of aryl, substituted aryl, heteroaryl, substituted heteroaryl, non-aromatic heterocyclyl, substituted non-aromatic heterocyclyl, non-aromatic heterocyclylalkyl and substituted non-aromatic heterocyclylalkyl.

53. (Previously Presented) The method of Claim 51 wherein R' is phenyl or substituted phenyl.

54. (Original) The method of Claim 51 wherein j is 0.

55. (Original) The method of Claim 51 wherein q is 0 or 1.

56. (Original) The method of Claim 51 wherein Z' is hydrogen or methyl and Z" is hydrogen.

57. (Currently Amended) The method of Claim 51 ~~in~~, wherein the compound has an (E) geometry.

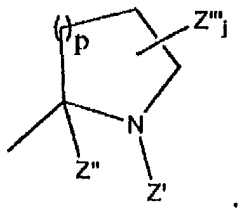
58. (Original) The method of Claim 51 wherein m and/or n are 0.

59. (Original) The method of Claim 51 wherein m is 1 and n is 0, and E is hydrogen and E^{I} is methyl.

60. (Original) The method of Claim 51 wherein m is 1 and n is 1, and E, E^{I} and E^{II} each are hydrogen and E^{III} is methyl.

61. (Original) The method of Claim 51 wherein the sum of m plus n is 1 or 2.

62. (Original) The method of Claim 1 wherein Q is



63. (Original) The method of Claim 51, wherein the compound is, (S)-(E)-3(2-pyrrolidin-2-ylvinyl)pyridine.

64. (Original) The compound of Claim 1, wherein the compound is (E)-(S)-3(4-hydroxyphenoxy)-5-(pyrrolidin-2-ylvinyl)pyridine.

65. (Original) The compound of Claim 1, wherein the compound is (E,S)-3-cyclopentyloxy-5-(pyrrolidin-2-ylvinyl)pyridine.

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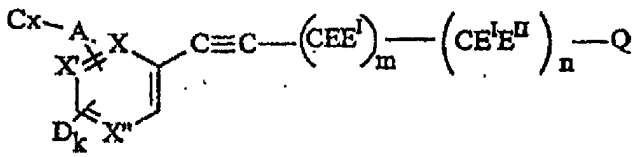
66. (Previously Presented) A method for treating a central nervous system disorder associated with dysfunction of nicotinic receptors, said method comprising of the administration of an effective amount of a compound having the formula:



where X" is nitrogen, X and X' are individually carbon bonded to a substituent species selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, heterocyclyl, substituted heterocyclyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl; arylalkyl, substituted arylalkyl, halo, -OR', -NR'R", -CF_3, -CN, -NO_2, -C_2R', -SR', -N_3, C(=O)NR'R", -NR'C(=O)R", -C(=O)R', -C(=O)OR', -OC(=O)R', -O(CR'R")$_r$C(=O)R', -O(CR'R")$_r$NR'R" -O(CR'R")$_r$NR"C(=O)R', -O(CR'R")$_r$NR"SO_2R', -OC(=O)NR'R", -NR'C(=O)O R", -SO_2R', -SO_2NR'R", and -NR'SO_2R", where R' and R" are individually hydrogen, lower alkyl, cycloalkyl, heterocyclyl, or an aromatic group-containing species selected from the group consisting of phenyl, benzyl, pyridinyl, pyrimidinyl, pyrazinyl, pyridazinyl, indolyl and quinolinyl, and r is an integer from 1 to 6, or R' and R" can together form a cycloalkyl group;

A is O, C=O or a covalent bond; D is a suitable non-hydrogen substituent species selected from the group of substituent species for ~~X, X' and X"~~; k is 0, 1 or 2; Cx is selected from a group consisting of aryl, substituted aryl, heteroaryl, substituted heteroaryl, non-aromatic heterocyclyl, substituted non-aromatic heterocyclyl, non-aromatic heterocyclylalkyl and substituted non-aromatic hetero-cyclylalkyl; m is an integer and n is an integer such that the sum of m plus n is 0, 1, 2 or 3; E, E^I, E^{II} and E^{III} individually represent hydrogen or a suitable non-hydrogen substituent selected from the group consisting of alkyl, substituted alkyl, halo-substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl; and Q is selected from:

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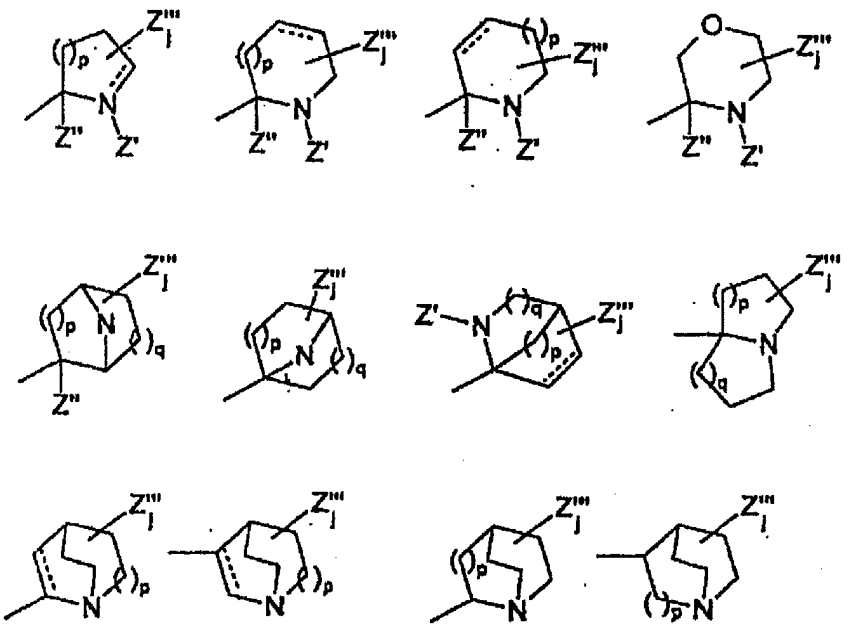

where Z' is hydrogen, lower alkyl, acyl, alkoxycarbonyl, or aryloxycarbonyl; Z" is hydrogen or lower alkyl; and Z"' is a non-hydrogen substituent selected from the group consisting of alkyl, substituted alkyl, halo-substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl; the dotted line indicates a carbon-carbon single bond or a carbon-carbon double bond; p is 0, 1 or 2; q is 0, 1, 2 or 3; and j is an integer from 0 to 3,

wherein Z'"j refers to j number of Z'" substituents, and

wherein the central nervous system disorder is selected from the group consisting of pre-senile dementia, senile dementia, HIV-dementia, multiple cerebral infarcts, Parkinsonism, Pick's disease, Huntington's chorea, tardive dyskindesia, hyperkinesias, mania, attention deficit disorder, anxiety, depression, mild cognitive impairment, dyslexia, schizophrenia and Tourette's syndrome.

Claims 67-72 (Cancelled)

73. (Previously Presented) The method of Claim 66 wherein X' is COR' where R' is selected from the group consisting of aryl, substituted aryl, heteroaryl, substituted heteroaryl, non-aromatic heterocyclyl, substituted non-aromatic heterocyclyl, non-aromatic heterocyclylalkyl and substituted non-aromatic heterocyclylalkyl.

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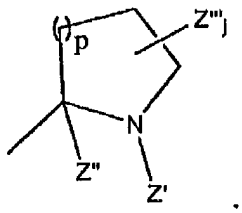
74. (Original) The method of Claim 66 wherein Q is



75. (Currently Amended) The method of Claim 66 ~~whereing~~ wherein the compound is selected from the group consisting of (S)-5-(2-pyrrolidin-2-ylethynyl)pyrimidine, (R)-5-(2-pyrrolidin-2-ylethynyl)pyrimidine, (S)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (R)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-isopropoxy-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-phenyl-5-(pyrrolidin-2-ylethynyl)pyridine, (S)-3-(phenoxyphenyl)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(4-methoxyphenoxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(4-hydroxyphenoxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-cyclopentyloxy-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-cyclohexyloxy-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(4-pyrrolidine-1-sulfonyl)phenoxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(3-pyridyloxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine, (S)-3-(pyrrolidin-2-ylethynyl)-5-(tetrahydropyran-4-yloxy)pyridine, and (S)-3-(3,5-dihydroxy)phenoxy)-5-(2-pyrrolidin-2-ylethynyl)pyridine.